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NOTE ON A SPECIES OF NOSEMA INFECTING *ATTACUS CYNTHIA* DRURY

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While working on dead larvae of *Attacus cynthia* Drury I met with many individuals which were infected by a species of Nosema with spores characterized by shape and refraction of light sufficiently different from those of the silk-worm parasite, *Nosema bombycis* Nägeli, to distinguish it from that species, although more closely allied to it than to any other species of the genus.

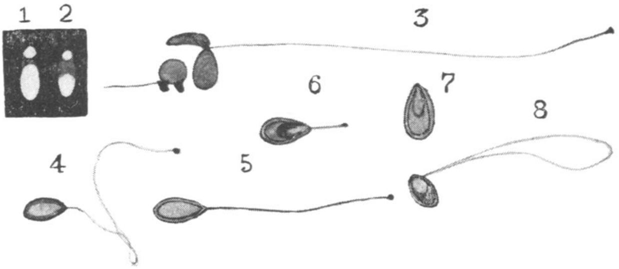
The following note is meant to give a short description of the structure of the spores thus far observed, the details of the same as well as the life-history of the parasite being reserved for further investigations.

The spores taken directly from the body of the worm were fixed in sublimate-alcohol and stained with Giemsa's solution. Heidenhain's and Delafield's hematoxylin were also used. For the protrusion of the polar filament I employed the method which Kudo (1913) tried with success for the spores of *Nosema bombycis* Nägeli.

The spores (Figs. 1 and 2) are ovoid, tapering toward each end. The refraction of light under the microscope is not so sharp as those of other species. On account of the taper they look long and narrow, like the spores of the species infecting *Anthaerae pernyi* Guér. and *A. yamamai* Guér., but measurements show that this is not the case, the length and the breadth of the spores of the present species being 3 to 3.5μ and 2μ, respectively, like those of *Nosema bombycis,* the measurements of which given by Kudo (1916), were 3 to 4μ in length and 1.5 to 2μ in breadth, by Stempell (1909) 4μ in length and 2μ in breadth, and by Omori (1912) 2 to 4μ in length and 1 to 2μ in breadth.

The spore is covered by a thick membrane of a transparent and homogeneous substance like that of *N. bombycis,* but as mentioned above, the refraction of light is not so sharp as in that species. The inner membrane, observed for the first time by Kudo (1916), also exists in the present species and can be pressed out easily. The outer membrane, however, appears to be rather brittle, as it is liable to be crushed into two or more pieces during the process of pressing. With an India ink preparation (Burri's method) the protoplasm stains slightly black, as does that of the silk-worm Nosema (Figs. 1 and 2).

The polar filament can be easily extruded from the end of the spore by the method used by Kudo (1913) for *Nosema bombycis.* It is somewhat shorter and thicker than that of the latter, being about 30 to 35μ in length. The filament ends always in a round knob of special form (Figs. 3, 4, 5 and 6), which is most probably of a sticky nature. In some specimens of *N. bombycis*, the polar filament has a round end, but not in all, and this again is not so well pronounced as in the present species. Moreover, the filament is not coiled transversely within the spore as in that of *N. bombycis* or of *N. anomalum* Monz., as is assumed to be the case by Stempell in these species. Careful observation of the spore under a high power shows a clear line running longitudinally within the body, which in some appears to be placed in parallels (Fig. 7). These lines undoubtedly represent the filament coiled up within the polar capsule; and when the filament begins to uncoil and a part of it protrudes from the body of the spore, concentric lines can often be seen within the latter (Fig. 6). Sometimes the filament extruded from the side of the spore takes the form of a ring, which is most probably caused by the sticking of the round end of the spore at the base of the filament (Fig. 8).



(All the figures are drawn with the help of an Abbé-Zeiss camera.)

Figs. 1 and 2.—Spores with protoplasm stained slightly black. India ink preparation. In Figure 1 narrow and Figure 2 broad. × 1545.

Figs. 3 and 4.—Spores with extruded polar filaments. The end of the filament has a round point. ×1545. (Figure 3 shows some crushed pieces of outer membrane which are deeply stained.)

Figs. 5, 6, and 7.—Spores containing coiled filament. In Figures 5 and 6 filament partially extruded. × 1545.

Fig. 8.—Polar filament extruded from side of spore. × 1545.

Finally, I wish to express my hearty thanks to Prof. Dr. C. Ishikawa for his kind advice in the preparation of this paper.

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